



Designation: **E1732 – 18a E1732 – 18b**

Standard Terminology Relating to Forensic Science¹

This standard is issued under the fixed designation E1732; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This terminology standard includes definitions of terms used in the forensic sciences.

1.2 This is a compilation of terms and corresponding definitions used in the forensic sciences. Legal or scientific terms, legal and scientific terms in common use that are generally understood or defined adequately in other readily available sources may not be included, except when dictionaries show multiple definitions and it seems desirable to indicate the definitions recommended for forensic science use.

1.3 Section A defines terms that are common to multiple areas of forensic science, whereas, the subsequent sections define terms pertaining to specific forensic science areas, as follows:

Section A: General (Common) Forensic Science Terms

The terms defined in Section A are the direct responsibility of Subcommittee E30.92, Terminology.

Section B: Criminalistics

The terms defined in Section B are the direct responsibility of Subcommittee E30.01, Criminalistics.

Section B1: Terms for Seized Drug Analysis

Section B2: Terms for Gunshot Residue (GSR) Analysis and Smokeless Powder Analysis

Section B3: Terms for Paint Analysis

Section B4: Terms for Textile, Fiber, Cord, and Tape Examination

Section B5: Terms for Glass Examination

Section C: Digital and Multimedia Evidence

The terms defined in Section C are the direct responsibility of Subcommittee E30.12, Digital and Multimedia Evidence.

Section C1: Terms for Computer Forensics

Section C2: Terms for Digital Image Processing and Multimedia Evidence Examination

Section C3: Terms for Magnetic Card Reader Examination

Section C4: Terms for Facial Image Examination

Section D: Interdisciplinary

The terms defined in Section D are the direct responsibility of Subcommittee E30.11, Interdisciplinary Forensic Science Standards.

Section E: Questioned Documents

The terms defined in Section E were formerly the direct responsibility of Subcommittee E30.02, Questioned Documents, and are currently the direct responsibility of Subcommittee E30.90, Executive Committee.

1.4 Entries listed in Sections B–E reflect only those existing in Committee E30 standards current with the date of a once yearly review of Committee E30 standards. Changes to standards or entries following this date will appear in Sections B–E after the following year’s review date.

1.5 A definition is a single sentence with additional information included in a. An alphabetical list of the terms defined in this Discussion standard. It is reviewed every five years, and the year of last review or revision is appended, which also identifies the section(s) in which each term is defined.

1.6 Definitions identical to those published by another standards-developing organization or ASTM committee are identified with the abbreviation of the name of the organization or the identifying document and ASTM committee; for example, ASME is the American Society of Mechanical Engineers.

1.7 Definitions of terms specific to a particular field are identified with an abbreviation. In some cases different usage of a term in different fields has been noted.

¹ This terminology is under the jurisdiction of ASTM Committee E30 on Forensic Sciences and is the direct responsibility of Subcommittee E30.92 on Terminology. Current edition approved June 1, 2018; Nov. 1, 2018. Published June 2018; March 2019. Originally approved in 1995. Last previous edition approved in 2018 as E1732 – 18; E1732 – 18a. DOI: 10.1520/E1732-18A; 10.1520/E1732-18B.

1.8 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

[C162 Terminology of Glass and Glass Products](#)

[D123 Terminology Relating to Textiles](#)

[D6161 Terminology Used for Microfiltration, Ultrafiltration, Nanofiltration and Reverse Osmosis Membrane Processes](#)

[E131 Terminology Relating to Molecular Spectroscopy](#)

[E177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods](#)

[E308 Practice for Computing the Colors of Objects by Using the CIE System](#)

[E456 Terminology Relating to Quality and Statistics](#)

[E860 Practice for Examining And Preparing Items That Are Or May Become Involved In Criminal or Civil Litigation](#)

[E1187 Terminology Relating to Conformity Assessment \(Withdrawn 2006\)³](#)

[E1301 Guide for Proficiency Testing by Interlaboratory Comparisons \(Withdrawn 2012\)³](#)

[E1402 Guide for Sampling Design](#)

[E1588 Practice for Gunshot Residue Analysis by Scanning Electron Microscopy/Energy Dispersive X-Ray Spectrometry](#)

[E1605 Terminology Relating to Lead in Buildings](#)

[E1610 Guide for Forensic Paint Analysis and Comparison](#)

[E1968 Guide for Microcrystal Testing in Forensic Analysis of Cocaine](#)

[E1969 Guide for Microcrystal Testing in Forensic Analysis of Methamphetamine and Amphetamine](#)

[E2125 Guide for Microcrystal Testing in Forensic Analysis of Phencyclidine and Its Analogues](#)

[E2161 Terminology Relating to Performance Validation in Thermal Analysis and Rheology](#)

[E2224 Guide for Forensic Analysis of Fibers by Infrared Spectroscopy](#)

[E2225 Guide for Forensic Examination of Fabrics and Cordage](#)

[E2227 Guide for Forensic Examination of Non-Reactive Dyes in Textile Fibers by Thin-Layer Chromatography](#)

[E2228 Guide for Microscopical Examination of Textile Fibers](#)

[E2363 Terminology Relating to Process Analytical Technology in the Pharmaceutical Industry](#)

[E2388 Guide for Minimum Training Requirements for Forensic Document Examiners](#)

[E2678 Guide for Education and Training in Computer Forensics](#)

[E2710 Guide for Preservation of Charred Documents](#)

[E2711 Guide for Preservation of Liquid Soaked Documents](#)

[E2765 Practice for Use of Image Capture and Storage Technology in Forensic Document Examination](#)

[E2808 Guide for Microspectrophotometry and Color Measurement in Forensic Paint Analysis](#)

[E2809 Guide for Using Scanning Electron Microscopy/X-Ray Spectrometry in Forensic Paint Examinations](#)

[E2882 Guide for Analysis of Clandestine Drug Laboratory Evidence](#)

[E2916 Terminology for Digital and Multimedia Evidence Examination](#)

[E2927 Test Method for Determination of Trace Elements in Soda-Lime Glass Samples Using Laser Ablation Inductively Coupled Plasma Mass Spectrometry for Forensic Comparisons](#)

[E2937 Guide for Using Infrared Spectroscopy in Forensic Paint Examinations](#)

[E2998 Practice for Characterization and Classification of Smokeless Powder](#)

[E2999 Test Method for Analysis of Organic Compounds in Smokeless Powder by Gas Chromatography-Mass Spectrometry and Fourier Transform Infrared Spectroscopy](#)

[E3017 Practice for Examining Magnetic Card Readers](#)

[E3085 Guide for Fourier Transform Infrared Spectroscopy in Forensic Tape Examinations](#)

[E3115 Guide for Capturing Facial Images for Use with Facial Recognition Systems](#)

[E3148 Guide for Postmortem Facial Image Capture](#)

[E3149 Guide for Facial Image Comparison Feature List for Morphological Analysis](#)

[F2725 Guide for European Union's Registration, Evaluation, and Authorization of Chemicals \(REACH\) Supply Chain Information Exchange](#)

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the ~~standard's~~ Document Summary page on the ASTM website.

³ The last approved version of this historical standard is referenced on www.astm.org.

2.2 ISO Standards:⁴

ISO 3534:1993 (E/F) Statistics—Vocabulary and Symbols

Part 1: Probability and General Statistical Terms

Part 2: Statistical Quality Control

ISO 3534–1:2006 Statistics—Vocabulary and Symbols—Part 1: General Statistical Terms and Terms Used in Probability

ISO 9000:2005 (E) Standard Quality Management Systems—Fundamentals and Vocabulary

ISO Guide 2 General Terms and Their Definitions Relating to Standardizing Activities

ISO Guide 30 Terms and Definitions Used in Connection with Reference Materials

ISO Guide 35 Reference Materials—General and Statistical Principles for Certification

ISO GUM Guide to the Expression of Uncertainty in Measurement (GUM)

ISO/IEC 7813 Information Technology—Identification Cards—Financial Transaction Cards

2.3 Other Sources:

ANSI/NIST-ITL 1-2011 Data Format for the Interchange of Fingerprint, Facial, and Other Biometric Information⁵

EURACHEM *The Fitness for Purpose of Analytical Methods*, EURACHEM Working Group, English Edition

IAAI *Glossary Glossary of Terms Related to Chemical and Instrumental Analysis of Fire Debris*, IAAI Forensic Science Committee⁶

IEEE 100-2000 *The Authoritative Dictionary of IEEE Standards Terms, 7th Edition*⁷

IUPAC Terminology *IUPAC Compendium of Chemical Terminology*, Second Edition, 1997

NIST SP 800-86 *Guide to Integrating Forensic Techniques into Incident Response*⁵

NIST SP 800-88 *Guidelines for Media Sanitization*⁵

SWGDRUG⁸

SWGIT/SWGDE *Digital and Multimedia Evidence Glossary*⁹

3. Significance and Use

3.1 These terms have particular application to the forensic sciences. In addition, a hierarchy of sources of definitions were used in the development of this terminology. The hierarchy is as follows: *Websters Webster's New Collegiate 7th Dictionary*; technical dictionaries; and the *Compilation of ASTM Standard Definitions-Definitions (1)*.¹⁰ The subcommittee developed a suitable definition after all of the sources in the hierarchy were found wanting.

4. Terminology

4.1 Definitions:

accelerant, *n*—any material used to initiate or promote the spread of a fire. The most common accelerants are flammable or combustible liquids. Whether a substance is an accelerant depends not on its chemical structure but on its use. **IAAI Glossary**

accuracy, *n*—the closeness of agreement between a test result and the accepted reference value. **E177**

DISCUSSION—

(1) In practice, the accepted reference value is substituted for the true value.

(2) The term "accuracy," when applied to a set of test or measurement results, involves a combination of random components and a common systematic error or bias component.

(3) Accuracy refers to a combination of trueness and precision. **ISO 3534:1993(E/F)**

associative evidence, *n*—that evidence which tends to link a person, place, or thing with another person, place, or thing.

calibration, *n*—the set of operations that establishes, under specified conditions, the relationship between values indicated by a measuring instrument or measuring system or values represented by a material, and the corresponding known values of measurement.

⁴ Available from International Organization for Standardization (ISO), ISO Central Secretariat, BIBC II, Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, Switzerland, <http://www.iso.org>.

⁵ Available from National Institute of Standards and Technology (NIST), 100 Bureau Dr., Stop 1070, Gaithersburg, MD 20899-1070, <http://www.nist.gov>.

⁶ Available from the International Association of Arson Investigators, Inc. (IAAI), 2111 Baldwin Avenue, Suite 203, Crofton, MD 21114, <https://www.firearson.com>.

⁷ Available from Institute of Electrical and Electronics Engineers, Inc. (IEEE), 445 Hoes Ln., Piscataway, NJ 08854, <http://www.ieee.org>.

⁸ ASTM Committee on Terminology, *Compilation of ASTM Standard Definitions*, 7th ed., Philadelphia, PA: ASTM, 1990: Available from the Scientific Working Group for the Analysis of Seized Drugs, <http://www.swgdrug.org>.

⁹ *Webster's Unabridged Dictionary*, 1967, s.v. "class." Information regarding Scientific Working Group on Imaging Technology/Scientific Working Group on Digital Evidence (SWGIT/SWGDE) is available from International Association for Identification (IAI), 2535 Pilot Knob Road, Suite 117, Mendota Heights, MN 55120-1120, <http://www.theiai.org>.

¹⁰ Osterburg J.W., and Ward, R.H., *Criminal Investigation: A Method for Reconstructing the Past*, Anderson Pub. Co.: Cincinnati, OH: 1992: The boldface numbers in parentheses refer to a list of references at the end of this standard.

DISCUSSION—

This definition was originally defined in Terminology [E1187](#), a standard discontinued by ASTM.

chain of custody, *n*—procedures and documents that account for the possession of a sample by tracking its handling and storage from its point of collection to its final disposition.

class, *n*—a group, set or kind marked by common attributes or a common attribute. — **Webster’s Unabridged Dictionary**⁹

class characteristic(s), *n*—the attribute(s) that establish membership in a class.

classification, *n*—the systematic arrangement of persons or objects into categories (groups or classes) based on shared traits or characteristics. — **Osterburg and Ward**,¹⁰ p. 835

comparison sample, *n*—*fire debris*, (1) a sample of material collected from a fire scene which is, to the best of the collector’s knowledge, similar with respect to relevant characteristics to a sample suspected of containing ignitable substance, but which is not expected to contain an ignitable substance; (2) a sample of suspected ignitable substance submitted for the purpose of comparing with any ignitable substance separated from a debris sample.

DISCUSSION—

A comparison sample should not be confused with a control sample. For example, a comparison sample might include unburned carpet or flooring that meets the requirements in (1).

control sample, *n*—material of established origin that is used to evaluate the performance of a test or comparison.

DISCUSSION—

A control sample should not be confused with a comparison sample. For example, in fire debris, a control sample might include an empty can from the same lot as that used to collect samples.

criminalistics, *n*—a branch of forensic science concerned with the examination and interpretation of physical evidence, for the purpose of aiding forensic investigation.

exemplar, *n*—a specimen of physical evidence of known origin. — **Osterburg and Ward**,¹⁰ p. 837

expanded uncertainty (U), *n*—quantity defining an interval about a result of a measurement that may be expected to encompass a large fraction of the distribution of values that could reasonably be attributed to the measurand.

<https://standards.iteh.ai/catalog/standards/sist/58d7c341-8cf8-428e-808a-7f14ff47dcac/astm-e1732-18b>

DISCUSSION—

- (1) The fraction may be regarded as the coverage probability or level of confidence of the interval.
- (2) To associate a specific level of confidence with the interval defined by the expanded uncertainty requires explicit or implicit assumptions regarding the probability distribution characterized by the measurement result and its combined standard uncertainty. The level of confidence that may be attributed to this interval can be known only to the extent to which such assumptions can be justified.
- (3) An expanded uncertainty *U* is calculated from a combined standard uncertainty *u_c* and coverage factor *k* using:

$$U = k \times u_c$$

ISO-GUM, EURACHEM

false positive, *n*—a test result that states that a drug is present when, in fact, such a drug is not present in an amount greater than a threshold or designated cut-off concentration.

known, *n*—of established origin associated with the matter under investigation.

limit of detection, *n*—the lowest content that can be measured with reasonable statistical certainty. — **EURACHEM**

EURACHEM

population, *n*—the totality of items or units of material under consideration.

DISCUSSION—

The word “items” may be interpreted in the sense of measurements, or possible measurements, of a single characteristic, or occasionally for multiple characteristics, on all items or units of material being considered. The word “totality” may refer to items not available for inclusion in samples as well as those which are available. — **E456**

procedure, *n*—specified way to carry out an activity or a process.

DISCUSSION

(1) Procedures can be documented or not.

(2) When a procedure is documented, the term “written procedure” or “documented procedure” is frequently used. The document that contains a procedure can be called a “procedure document.” **ISO 9000:2005(E)**

proficiency testing, *n*—*laboratory*, determination of laboratory testing performance by means of interlaboratory test comparisons. **E1301**

qualitative analysis, *n*—*chemical*, analysis in which substances are identified or classified on the basis of their chemical or physical properties, such as chemical reactivity, solubility, molecular weight, melting point, radiative properties (emission, absorption), mass spectra, nuclear half-life, etc. (See also **quantitative analysis**.) **IUPAC Terminology**

quality assurance, *n*—all the planned and systematic activities implemented within the quality system, and demonstrated as needed, to provide adequate confidence that an entity will fulfill requirements for quality. **ISO Guide 2**

quantitation limit, *n*—the minimum amount that can be quantitated with acceptable accuracy and precision. **E2161**

quantitative analysis, *n*—*chemical*, analyses in which the amount or concentration of an analyte may be determined (estimated) and expressed as a numerical value in appropriate units. Qualitative analysis may take place without quantitative analysis, but quantitative analysis requires the identification (qualification) of the analytes for which numerical estimates are given. **IUPAC Terminology**

questioned, *n*—associated with the matter under investigation about which there is some question, including, but not limited to, whether the questioned and known items have a common origin.

recovery, *n*—*chemical*, term used in analytical and preparative chemistry to denote the fraction of the total quantity of a substance recoverable following a chemical procedure. **IUPAC Terminology**

reference material, *n*—a material or substance, one or more of whose property values are sufficiently homogenous and well established to be used for the calibration of an apparatus, the assessment of a measurement method, or for assigning values to materials. **E1301**

repeatability, *n*—precision under repeatability conditions. **E177, E456**

repeatability conditions, *n*—conditions where independent test results are obtained with the same method on identical test items in the same laboratory by the same operator using the same equipment within short intervals of time. **E177, E456**

reproducibility, *n*—precision under reproducibility conditions. **E177, E456**

reproducibility conditions, *n*—conditions where test results are obtained with the same method on identical test items in different laboratories with different operators using different equipment. **E177, E456**

sample—subset of a population made up of one or more sampling units. **ISO 3534-1:2006**

population—totality of items under consideration. **ISO 3534-1:2006**

DISCUSSION

Note that a population may be real and finite, real and infinite, or completely hypothetical.

sampling unit—one of the individual parts into which a population is divided. **ISO 3534-1:2006**

sampling, *n*—(the) process of drawing or constituting a sample. **E1402, ISO 3534:1993**

selectivity, *n*—(1) (*qualitative*): the extent to which other substances interfere with the determination of a substance according to a given procedure; (2) (*quantitative*): a term used in conjunction with another substantive (for example, constant, coefficient, index, factor, number) for the quantitative characterization of interferences. **EURACHEM, IUPAC Terminology**

standard, *n*—material of established origin with certified properties.

test, *n*—determination of one or more characteristics according to a procedure. **ISO 9000:2005(E)**

test method, *n*—a definitive procedure that produces a test result. **E456**

traceability—property of a result of a measurement or value of a standard whereby it can be related with a stated uncertainty, to stated references, usually national or international standards through an unbroken chain of comparisons. **ISO Guide 30:1992(E/F)**

DISCUSSION—

- (1) The concept is often expressed by the adjective traceable.
- (2) The unbroken chain of comparisons is called a traceability chain.
- (3) (Applicable only to the French text.)
- (4) Traceability of values in the certification of reference materials for chemical composition is discussed in ISO Guide 35:1989 (subclause 9.3.1) where attention is drawn to the special problems associated with chemical analysis. Traceability of the chemical species is frequently of equal or greater importance than the traceability of the calibration of the instruments used in the analysis.

validation, *n*—confirmation, through the provision of objective evidence, that the requirements for a specific intended use or application have been fulfilled.

DISCUSSION—

- (1) The term “validated” is used to designate the corresponding status.
- (2) The use conditions for validation can be real or simulated. **ISO 9000:2005(E)**

verification, *n*—confirmation, through the provision of objective evidence, that specified requirements have been fulfilled.

DISCUSSION—

- (1) The term “verified” is used to designate the corresponding status.
- (2) Confirmation can comprise activities such as: performing alternative calculations; comparing a new design specification with a similar proven design specification; and undertaking tests and demonstrations, and reviewing documents prior to issue. **ISO 9000:2005(E)**

SECTION A: GENERAL (COMMON) FORENSIC SCIENCE TERMS

The terms defined in Section A are the direct responsibility of Subcommittee E30.92, Terminology.

accelerant, *n*—any material used to initiate or promote the spread of a fire. The most common accelerants are flammable or combustible liquids. Whether a substance is an accelerant depends not on its chemical structure but on its use. **IAAI Glossary**

accuracy, *n*—the closeness of agreement between a test result and the accepted reference value. **E177**

DISCUSSION—

- (1) In practice, the accepted reference value is substituted for the true value.
- (2) The term “accuracy,” when applied to a set of test or measurement results, involves a combination of random components and a common systematic error or bias component.
- (3) Accuracy refers to a combination of trueness and precision. **ISO 3534:1993(E/F)**

associative evidence, *n*—that evidence which tends to link a person, place, or thing with another person, place, or thing.

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DISCUSSION—

This definition was originally defined in Terminology **E1187**, a standard discontinued by ASTM.

chain of custody, *n*—procedures and documents that account for the possession of a sample by tracking its handling and storage from its point of collection to its final disposition.

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class characteristic(s), *n*—the attribute(s) that establish membership in a class.

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Osterburg and Ward (3), p. 835

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A comparison sample should not be confused with a control sample. For example, a comparison sample might include unburned carpet or flooring that meets the requirements in *(1)*.

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exemplar, *n*—a specimen of physical evidence of known origin.

Osterburg and Ward (3), p. 837

expanded uncertainty (U), *n*—quantity defining an interval about a result of a measurement that may be expected to encompass a large fraction of the distribution of values that could reasonably be attributed to the measurand.

ISO GUM, EURACHEM

DISCUSSION—

(1) The fraction may be regarded as the coverage probability or level of confidence of the interval.

(2) To associate a specific level of confidence with the interval defined by the expanded uncertainty requires explicit or implicit assumptions regarding the probability distribution characterized by the measurement result and its combined standard uncertainty. The level of confidence that may be attributed to this interval can be known only to the extent to which such assumptions can be justified.

(3) An expanded uncertainty *U* is calculated from a combined standard uncertainty *uc* and coverage factor *k* using:

$$U = k \times uc$$

false positive, *n*—a test result that states that a drug is present when, in fact, such a drug is not present in an amount greater than a threshold or designated cut-off concentration.

known, *adj*—of established origin associated with the matter under investigation.

limit of detection, *n*—the lowest content that can be measured with reasonable statistical certainty.

EURACHEM

population, *n*—the totality of items or units of material under consideration.

DISCUSSION—

The word “items” may be interpreted in the sense of measurements, or possible measurements, of a single characteristic, or occasionally for multiple characteristics, on all items or units of material being considered. The word “totality” may refer to items not available for inclusion in samples as well as those which are available.

E456

procedure, *n*—specified way to carry out an activity or a process.

DISCUSSION—

(1) Procedures can be documented or not.

(2) When a procedure is documented, the term “written procedure” or “documented procedure” is frequently used. The document that contains a procedure can be called a “procedure document.”

ISO 9000:2005(E)

- proficiency testing**, *n*—*laboratory*, determination of laboratory testing performance by means of interlaboratory test comparisons. **E1301**
-
- qualitative analysis**, *n*—*chemical*, analysis in which substances are identified or classified on the basis of their chemical or physical properties, such as chemical reactivity, solubility, molecular weight, melting point, radiative properties (emission, absorption), mass spectra, nuclear half-life, etc. (See also **quantitative analysis**.) **IUPAC Terminology**
- quality assurance**, *n*—all the planned and systematic activities implemented within the quality system, and demonstrated as needed, to provide adequate confidence that an entity will fulfill requirements for quality. **ISO Guide 2**
-
- quantitation limit**, *n*—the minimum amount that can be quantitated with acceptable accuracy and precision. **E2161**
- quantitative analysis**, *n*—*chemical*, analyses in which the amount or concentration of an analyte may be determined (estimated) and expressed as a numerical value in appropriate units. Qualitative analysis may take place without quantitative analysis, but quantitative analysis requires the identification (qualification) of the analytes for which numerical estimates are given. **IUPAC Terminology**
- questioned**, *n*—associated with the matter under investigation about which there is some question, including, but not limited to, whether the questioned and known items have a common origin.
- recovery**, *n*—*chemical*, term used in analytical and preparative chemistry to denote the fraction of the total quantity of a substance recoverable following a chemical procedure. **IUPAC Terminology**
- reference material**, *n*—a material or substance, one or more of whose property values are sufficiently homogenous and well established to be used for the calibration of an apparatus, the assessment of a measurement method, or for assigning values to materials. **E1301**
-
- repeatability**, *n*—precision under repeatability conditions. **E177, E456**
- repeatability conditions**, *n*—conditions where independent test results are obtained with the same method on identical test items in the same laboratory by the same operator using the same equipment within short intervals of time. **E177, E456**
- reproducibility**, *n*—precision under reproducibility conditions. **E177, E456**
- reproducibility conditions**, *n*—conditions where test results are obtained with the same method on identical test items in different laboratories with different operators using different equipment. **E177, E456**
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- sample**—subset of a population made up of one or more sampling units. **ISO 3534-1:2006**
population—totality of items under consideration. **ISO 3534-1:2006**
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- DISCUSSION—**
- Note that a population may be real and finite, real and infinite, or completely hypothetical.
- sampling unit*—one of the individual parts into which a population is divided. **ISO 3534-1:2006**
-
- sampling**, *n*—(the) process of drawing or constituting a sample. **E1402, ISO 3534:1993**
- selectivity**, *n*—(1) (*qualitative*): the extent to which other substances interfere with the determination of a substance according to a given procedure; (2) (*quantitative*): a term used in conjunction with another substantive (for example, constant, coefficient, index, factor, number) for the quantitative characterization of interferences. **EURACHEM, IUPAC Terminology**
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- standard**, *n*—material of established origin with certified properties.
- test**, *n*—determination of one or more characteristics according to a procedure. **ISO 9000:2005(E)**
- test method**, *n*—a definitive procedure that produces a test result. **E456**
- traceability**—property of a result of a measurement or value of a standard whereby it can be related with a stated uncertainty, to stated references, usually national or international standards through an unbroken chain of comparisons. **ISO Guide 30:1992(E/F)**
-
- DISCUSSION—**

(1) The concept is often expressed by the adjective traceable.

(2) The unbroken chain of comparisons is called a traceability chain.

(3) (Applicable only to the French text.)

(4) Traceability of values in the certification of reference materials for chemical composition is discussed in ISO Guide 35:1989 (subclause 9.3.1) where attention is drawn to the special problems associated with chemical analysis. Traceability of the chemical species is frequently of equal or greater importance than the traceability of the calibration of the instruments used in the analysis.

validation, *n*—confirmation, through the provision of objective evidence, that the requirements for a specific intended use or application have been fulfilled.

DISCUSSION—

(1) The term “validated” is used to designate the corresponding status.

(2) The use conditions for validation can be real or simulated.

ISO 9000:2005(E)

verification, *n*—confirmation, through the provision of objective evidence, that specified requirements have been fulfilled.

DISCUSSION—

(1) The term “verified” is used to designate the corresponding status.

(2) Confirmation can comprise activities such as: performing alternative calculations; comparing a new design specification with a similar proven design specification; and undertaking tests and demonstrations, and reviewing documents prior to issue.

ISO 9000:2005(E)

SECTION B: CRIMINALISTICS

The terms defined in Section B are the direct responsibility of Subcommittee E30.01, Criminalistics.

Section B1: Terms for Seized Drug Analysis

aggregation, *n*—the collecting of units or parts into a mass or whole. E1968, E1969, E2125

birefringence, *n*—property of some crystals, having more than one refractive index; this property will result in interference colors, which are viewed through a polarized light microscope. E1968, E1969

birefringence, *n*—property of some crystals having more than one refractive index; this will result in interference colors which are viewed through a polarized light microscope. E2125

blades, *n*—broad, flat, elongated crystals. E1969

capacity—the amount of finished product that could be produced, either in one batch or over a defined period of time, and given a set list of variables. SWGDRUG, E2882

catalyst—a substance whose presence initiates or changes the rate of a chemical reaction, but does not itself enter into the reaction. D6161, E2882

cocaine, *n*—either *d*- or *l*- cocaine; it should be noted that *l*-cocaine is the naturally occurring isomer found in the coca plant. E1968

dendritic, *adj*—multibrachiate or branching crystals, growing in a tree-like manner; each branch of the crystal is contiguous structurally. E1968

finished product—a manufactured product ready for use. SWGDRUG, E2882

grains, *n*—thick tablets having nearly equal width, breadth and thickness. E1969, E2125

habit, *n*—the external morphology of the crystal. E1968, E1969, E2125

intermediate—substance that is manufactured for and consumed in or used for chemical processing to be transformed into another substance. F2725, E2882

microdrop, *n*—a small drop of liquid that would fit on the end of a standard size, flattened toothpick; the approximate volume of this drop would be 10 to 25 μ L. E1968, E1969, E2125

nails—a skeleton of some kinds of triangles, elongated, usually pointed with a short head usually thicker or broader. E2125

needles (acicular), *n*—long, thin crystals with pointed ends. E1968, E1969, E2125

nuggets—irregularly formed grains without sharp faces or edges. E2125

plates, *n*—blades with nearly equal length and breadth and of a thickness substantially less than the width. E1969

pliers —crystals resembling pliers, generally X-shaped.	E2125
razor blades —thin oblong crystals with length about twice the width, resembling a safety razor blade.	E2125
reagent —a chemical used to react with another chemical, often to confirm or deny the presence of the second chemical.	E1605, E2882
rods, <i>n</i> —long, thin crystals with squared off ends.	E1969
sheaves —elongated crystals form two opposite fans from the same joining point.	E2125
skeletal crystal —a crystal in which all of the spaces in the crystal lattice are not occupied.	E2125
spindles —shorter than course needles, but more substantial cross-section.	E2125
tablets, <i>n</i> —plates with appreciable thickness but less than the length or breadth.	E1969
yield, expected —the quantity of material or the percentage of theoretical yield anticipated at any appropriate phase of production based on previous laboratory, pilot scale, or manufacturing data.	E2363, E2882
yield, theoretical —the quantity that would be produced at any appropriate phase of production based upon the quantity of material to be used, in the absence of any loss or error in actual production.	E2363, E2882

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Section B2: Terms for Gunshot Residue (GSR) Analysis and Smokeless Powder Analysis

- ball powders**, *n*—a class of smokeless powders produced by a process where the final grain morphologies are spherical, flattened-ball, or flake. **E2998**
- characteristic particles**, *n*—particles that have compositions rarely found in particles from any other source. **E1588**
- commonly associated particles**, *n*—particles have compositions that are also commonly found in environmental particles from numerous sources. However, when present, in addition to particles that are characteristic of, and/or consistent with GSR, these particles can be of significance in the interpretation of a population of particles and, consequently, the likelihood that that population is GSR. In isolation, however, such particles have little significance in examinations for GSR. **E1588**
- consistent particles**, *n*—particles that have compositions that are also found in particles from a number of relatively common, non-firearm sources. Particles within this group are produced through the operation of a variety of processes, equipment, or devices and can be found in the environment with varying levels of frequency. **E1588**
- deterrent**, *n*—a compound to slow the burning rate of a powder. **E2998**
- double-base**, *n*—propellant containing nitrocellulose and nitroglycerin. **E2998, E2999**
- energetic**, *n*—an explosive compound used to enhance the burning rate of a powder. **E2998**
- extruded powders**, *n*—a class of smokeless powders produced by an extrusion process where the final grain morphologies are disc or cylinder. **E2998**
- grain**, *n*—an individual particle of smokeless powder. **E2998, E2999**
- marker**, *n*—a colored grain of smokeless powder to assist in the visual identification of a bulk reloading smokeless powder. **E2998**
- morphology, n; morphological, adj**—referring to size, shape, structure, and texture. **E1588**
- perforation**, *n*—a hole in a disc powder or one or more holes running through the length of a cylinder powder created during the manufacturing process in extruded powders. **E2998**
- single-base**, *n*—propellant containing nitrocellulose as the major energetic material. **E2998, E2999**
- smokeless powder**, *n*—a propellant and low explosive composed of nitrocellulose and other organic and inorganic compounds. **E2998, E2999**
- stabilizer**, *n*—a compound to prevent or slow down self-decomposition. **E2998**
- stub**, *n*—sample device with an adhesive surface used to collect materials for SEM/EDS analysis. **E1588**
- triple-base**, *n*—propellant containing nitrocellulose, nitroglycerin, and nitroguanidine. **E2998, E2999**

Section B3: Terms for Paint Analysis

- absorbance**, *n*—logarithm to the base 10 of the reciprocal of spectral transmittance, (*T*). **E2808**

$$A = \log_{10}(1/T) = -\log_{10}T$$

DISCUSSION—

It is often expressed as a fraction or decimal value and may be referred to as optical density.

- absorption**, *n*—transformation of incident energy into longer wavelength energy. **E2808**
- additive (modifier)**—any substance added in a small quantity to improve properties. Additives can include substances such as driers, corrosion inhibitors, catalysts, ultraviolet absorbers, plasticizers, etc. **E1610**
- additive (modifier)**, *n*—any substance added in a small quantity to improve properties; additives include substances such as driers, corrosion inhibitors, catalysts, ultraviolet absorbers, and plasticizers. **E2937**
- background**, *n*—the signal produced by the entire analytical system apart from the material of interest. **E2937**
- background X-rays (Bremsstrahlung, braking radiation, continuous spectrum)**, *n*—nonspecific X-ray radiation with a continuous energy range from zero up to the beam voltage in which background radiation results from the deceleration of beam electrons in the atomic Coulombic field. **E2809**

DISCUSSION—

A typical X-ray spectrum consists of both a continuous background and peaks from characteristic X-rays.

backscattered electrons, *n*—primary beam electrons that are scattered from the sample after undergoing few inelastic interactions. **E2809**

DISCUSSION—

The probability of backscattering is proportional to the atomic number.

bandwidth, *n*—optical width of the monochromator exit slit or the optical width of a semiconductor detector element that will vary with monochromator design. **E2808**

DISCUSSION—

This term can also refer to the wavelength interval over which radiant energy is greater than 50 % of the maximum intensity.

binder—a non-volatile portion of a paint which serves to bind or cement the pigment particles together. **E1610**

binder, *n*—a nonvolatile portion of the liquid vehicle of a coating, which serves to bond or cement the pigment particles together. **E2937**

bulk analysis, *n*—type of scanning electron microscopy (SEM) analysis that determines the average elemental composition of a material in which the area of analysis is as large as possible and may be achieved by a single large area raster or the summed results from multiple smaller area rasters. **E2809**

cathodoluminescence, *n*—emission of photons in the ultraviolet (UV), visible (Vis), and infrared (IR) regions of the electromagnetic spectrum as a result of electron beam interaction with certain materials. **E2809**

characteristic X-rays, *n*—X-ray emission resulting from de-excitation of an atom following inner shell ionization in which the energy of the X-rays is related to the atomic number of the atom, providing the basis for energy dispersive X-ray spectrometry (EDS). **E2809**

DISCUSSION—

A typical X-ray spectrum consists of both a continuous background and peaks from characteristic X-rays.

charge-coupled device (CCD), *n*—a silicon-based semiconductor chip consisting of a two-dimensional matrix of photo sensors or pixels. **E2808**

charging, *n*—negative charge accumulation on either a nonconductive sample or a sample that is not properly grounded. **E2809**

DISCUSSION—

This effect may interfere with image formation and X-ray analysis because of beam deflection. It can usually be eliminated by the application of a conductive coating.

chromaticity, *n*—dimensions of a color stimulus, excluding luminous intensity, and expressed in terms of hue and saturation (Commission Internationale de l’Eclairage (CIE)) or redness-greenness and yellowness-blueness (L^* , a^* , b^*). **E2808**

DISCUSSION—

It is generally represented as a point in a constant luminance plane of a three-dimensional color space.

chromaticity coordinates, CIE, *n*—ratios of each of the three tristimulus values X, Y , and Z in relation to the sum of the three designated as x, y , and z , respectively. **E2808**

DISCUSSION—

They are sometimes referred to as the trichromatic coefficients. When written without subscripts, they are assumed to have been calculated for Illuminant C and the 2° (1931) Standard Observer unless specified otherwise. If they have been obtained for other illuminants or observers, a subscript describing the observer or illuminant should be used. For example, x_{10D} and y_{10D} are chromaticity coordinates for the 10° observer and Illuminant D.